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Forest Insect and Disease Management

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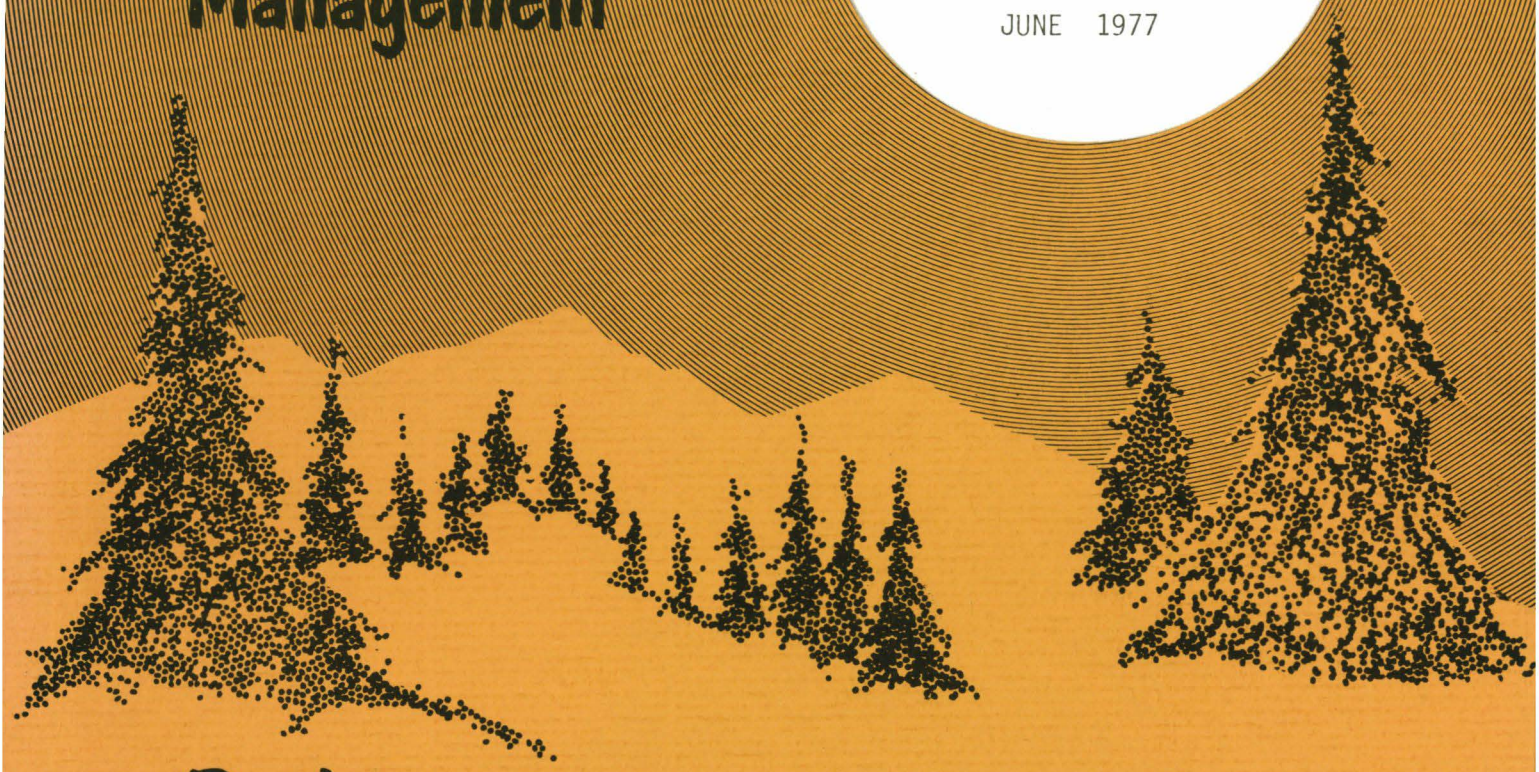
BIOLOGICAL
EVALUATION R2-77-19

WESTERN SPRUCE BUDWORM

on Federal and Private Lands
in the vicinity of
Vallecito Reservoir,
San Juan National Forest

JUNE 1977



Rocky Mountain Region

U.S. Department of Agriculture Forest Service

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PREPARED BY:
James P. Linnane
Entomologist

APPROVED BY:

G. L. DOWNING
Staff Director
Forest Insect and Disease Management

F. A. DORRELL
Deputy Regional Forester
State and Private Forestry

Forest Insect and Disease Management
State and Private Forestry
Rocky Mountain Region
USDA Forest Service
11177 W. 8th Avenue
Lakewood, Colorado 80225

INTRODUCTION

The western spruce budworm caused moderate and occasionally heavy defoliation to Douglas-fir, white fir, and spruce on federal and private lands in the vicinity of the Vallecito Reservoir during 1977. The budworm infestation has been gradually increasing since 1975. In 1977, approximately 4,000 acres were defoliated. In June 1977, a group of private landowners financed the aerial application of Malathion to approximately 800 acres of the infestation.

Predicted defoliation in the vicinity of the Vallecito Reservoir during 1978 should be less than experienced in 1977, particularly in the sprayed area.

TECHNICAL INFORMATION

CAUSAL AGENT: *Choristoneura occidentalis* Freeman, western spruce budworm

HOST TREES: *Pseudotsuga menziesii* (Mirb.) Franco, Douglas-fir
Abies concolor (Gord. and Glend.) Lindl., white fir
Picea pungens Engelm., blue spruce

LIFE HISTORY: The western spruce budworm normally has one generation per year. Moths usually emerge in late July or early August. Shortly after emergence females mate and lay egg masses on needles. The eggs hatch in about 10 days. The larvae do not feed, but seek hiding places among lichens or under bark scales where they spin silken shelters (hibernacula) in which they remain dormant overwinter.

In the spring, the larvae migrate to the foliage where they mine the needles for 1 to 2 weeks. About the time the buds start to swell, the larvae move to the expanding buds. As the new shoots unfurl, the larvae spin loose webs between the new needles, within which they feed until the new foliage is entirely destroyed before feeding on older needles. Larvae become full grown in 30 to 40 days after attacking the buds. The larvae pupate either in existing webs, or in webs they spin in other areas of the tree. Adult moths are poor flyers, but may be carried great distance by air currents, thereby spreading the infestation.

EXTENT OF OUTBREAK: Approximately 4,000 acres of Douglas-fir, white fir, and spruce along the east side of the Vallecito Reservoir and the Los Pinos River are currently infested by the western spruce budworm (Figure 1). The area and intensity of the infestation was mapped during the egg mass survey.

HOST STAND CONDITION: The spruce fir type in the infested zone has suffered light to moderate defoliation (up to 65% of the new foliage) since 1975. No tree mortality has occurred. The principle damage within the infestation zone has been reduced aesthetic values. Radial growth of infested trees is expected to be seriously reduced through the duration of the infestation.

RESULTS AND DISCUSSION

Results of the western spruce egg mass survey predict light defoliation (5 to 35% of the new foliage) in 1978. The infestation does not appear to be expanding. However, it may be capable of maintaining at near current levels for one or two more years. As a result of the current infestation, some seedling and sapling mortality may occur. No mortality to pole or sawtimber size trees is expected.

The area to the east of the Los Pinos River which received chemical treatment in 1977 (Figure 1) should exhibit less budworm damage than surrounding spruce-fir type during 1978.

RECOMMENDATIONS

No chemical control efforts are recommended for federal lands at this time. The close proximity of the infestation to the Vallecito Reservoir and Los Pinos River would make aerial insecticide application difficult to justify from an environmental standpoint. Silvicultural practices to lessen budworm damage have neither been adequately developed for practical application in white fir, Douglas-fir forest type nor feasible in current infestation zone. The present recommendation of Forest Insect and Disease Management is to allow the infestation to run its course. Natural agents will eventually reduce budworm populations to endemic levels. The insecticides Sevin and Malathion are registered for western spruce budworm control and available to private landowners wishing to protect their trees. Pesticide label instructions should be observed for effective results and to protect applicators and the environment.

REFERENCES

McKNIGHT, M. E. et al. 1970. Sequential sampling plan for western spruce budworm egg mass surveys in the central and southern Rocky Mountains. USDA, For. Serv. Res. Note RM-174. Rocky Mtn. For. and Range Exp. Sta. 8 p.

TABLE 1 RESULTS OF THE WESTERN SPRUCE BUDWORM EGG MASS SURVEY IN THE VALLECITO RESERVOIR AREA

Number of Samples	New Egg Masses	Old Egg Masses	New Egg Masses/Sample	1977 Defoliation	Predicted in 1978 Class	Predicted in 1978 Defoliation
60	61	40	1.02	Moderate	2	Light

Defoliation Classes

Class Limits: Sequential Plan for Western Spruce Budworm Egg Mass Surveys (McKnight 1970)

Classification	Percent Defoliation of New Growth	Class	New Egg Masses per 24" Branch	Prediction
Undetectable	0 - 5	1	0.250 or fewer	Undetectable
Light	5 - 35	2	0.275 to 1.0	Undetectable in "static" infestations Light in "increasing" infestations
Moderate	35 - 65	3	1.5 to 5.0	Light in "static" infestations Moderate in "increasing" infestations
Heavy	65 - 100	4	5.5 or more	Moderate or Heavy

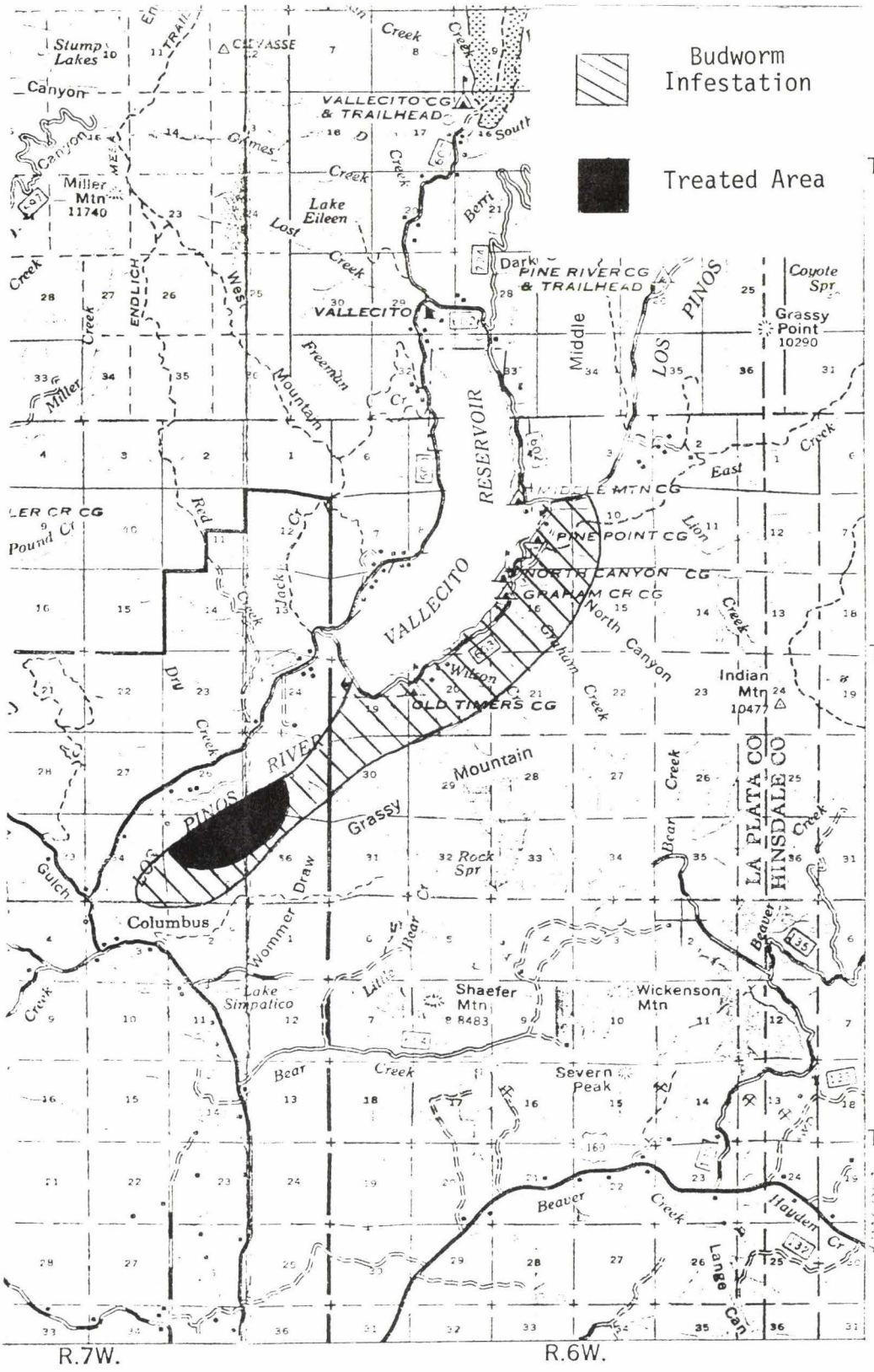
Budworm Infestation
Treated Area
T.37N.
T.36N.
T.35N.
R.7W.
R.6W.
VALLECITO CG & TRAILHEAD
PINE RIVER CG & TRAILHEAD
PINE POINT CG
NORTH CANYON CG
GRAHAM CR CG
OLD TIMERS CG
MIDDLE MTN CG
VALLECITO RESERVOIR
Stump Lakes
Miller Mtn 11740
Lake Eileen
Grassy Point 10290
Indian Mtn 10477
Columbus
Lake Simpatico
Shaefer Mtn 8483
Wickenson Mtn
Severn Peak
Rock Spr
Coyote Spr
Dark
Middle
East
Mountain
Grassy
Creek
Canyon
Draw
Gulch
River
Pinos
Los
La Plata Co
Hinsdale Co

Figure 1.